

## **Southern California Wetlands Recovery Project**

### **Wetlands Managers Group Report**

**May 18, 2001**

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#### **Project Updates**

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### **Update on Current Projects**

Over the past year, the Coastal Conservancy and Wetlands Managers Group (WMG) has been working with partner agencies to implement the projects on the 2000-2001 Work Plan. The Wetlands Recovery Project has made progress on several of these projects, but also faced one great setback at Ormond Beach. Highlights include:

- **Arroyo Hondo Acquisition** – The Land Trust for Santa Barbara County has an option to purchase the 800-acre ranch for \$6,176,000. The Coastal Conservancy authorized a \$4 million grant to the Land Trust in October 2000, including \$1 million of WRP funds. Additional funds are expected from WCB. The Land Trust is working to raise the remaining funds by October of this year.
- **Matilija Dam Feasibility Study** – Funding for the Matilija Dam Feasibility Study was approved in October 2000, including \$750,000 of WRP funds. The multi-year study is evaluating options for removing barriers to steelhead passage, restoring natural hydrologic regimes on the river, and restoring riparian and wetland habitat.
- **Ormond Beach Wetlands** – In February 2000, the Coastal Conservancy approved \$17 million in funding, including \$6.8 million of WRP funds, to acquire several properties from Southern California Edison, including 600 acres of existing and historic wetlands at Ormond Beach. Completion of the Ormond Beach acquisition was delayed by negotiations related to long-term liability issues. In January 2001, Edison removed the property from the market to evaluate its potential use for expanding power generation facilities. The Conservancy and the Huntington Beach Wetlands Conservancy continue to negotiate with Edison for acquisition of a 20-acre parcel at the Huntington Beach wetlands (see also project status reports in Attachment 2)
- **San Elijo Lagoon Enhancements** – Removal of exotic species and revegetation of a 2.4 acre parcel was completed in February. This project was the first in a multi-step effort to control exotic plants around the lagoon. The 2001-2002 Work Plan includes funding for a comprehensive exotic species removal program around the lagoon.
- **Famosa Slough Culvert Extension Feasibility Study** – A study to evaluate the feasibility of increasing tidal flow into Famosa Slough by reactivating a plugged culvert was recently completed. The study found that reactivating the culvert would be relatively

simple and inexpensive. The WRP is working with City of San Diego to proceed with implementation. This project is the requisite precursor to several actions recommended in the Famosa Slough Enhancement Plan.

- **Tijuana Estuary (Friendship Marsh) Restoration – Phase II** – Funding for the next phase of restoration at Tijuana Estuary was approved in April 2001, including \$450,000 from the WRP and \$208,000 from the EPA. Phase II will include restoration plans for another site within the 500-acre restoration area similar to the Model Marsh. The plan will also address engineering issues in the estuary needing further examination.

In addition to these projects, the WRP funded:

- Final design and engineering plans for removal of fish passage barriers in the Solstice Creek watershed
- Restoration studies for Buena Vista Lagoon, Topanga Creek watershed and lagoon, and four coastal watersheds in southern Santa Barbara County.

Of the 34 projects included on the 2000-2001 Work Plan, 8 have been completed or funded, 21 are still ongoing and will remain on the Work Plan, and 5 have been withdrawn from the Work Plan because they are either no longer feasible or require further project development. Of the 21 ongoing projects, one will be moved to the small grants program and one will be subsumed into a larger project. Attachment 1 provides a summary of costs and funding sources for the eight completed /funded projects. Attachment 2 provides brief status reports on the ongoing projects and explanations regarding projects withdrawn from the list. The ongoing projects are described in greater detail in the staff report on the 2001-2002 Work Plan.

## Monitoring of Completed Restoration Projects

The Working Agreement of the Wetlands Recovery Project requires the WRP to provide an annual report of monitoring results from completed wetlands enhancement projects. Monitoring data and reports will be posted to the WRP website as they become available. Currently monitoring data is being collected for the three projects described below. Monitoring results for these projects are summarized in greater detail in Attachment 3.

- **Tijuana Estuary Model Marsh** – Construction of the Model Marsh was completed in February 2000. The first year monitoring report is currently being prepared. Monitoring at the marsh is divided into six different projects, some of which address specific research questions. The primary research question the marsh was designed to evaluate is the effects of including tidal creeks in the restoration design. First year data shows that densities of fish and invertebrate populations in the marsh increased steadily for the first six months after opening the marsh. Bird use also increased steadily with high use in the fall and winter by migratory birds. Initial data from the tidal creeks study found that fish were equally abundant in the cells with and without tidal creeks; however, fish were more evenly distributed over both the low- and mid-marsh areas in the cells with tidal creeks.

- **San Joaquin Freshwater Marsh, Phase I** – Construction of the seasonal ponds at San Joaquin Freshwater Marsh was completed in April 2000. The first year of monitoring data establishes a baseline to compare against future monitoring data as the marsh develops. Mortality rates for some of the wetland and riparian trees species were higher than expected, but these results have been addressed through adaptive management at the marsh. This past year, one pair of gnatcatchers nested in the newly restored coastal sage scrub habitat bordering the marsh.
- **San Elijo Lagoon Ocean Inlet Endowment** – The San Elijo Lagoon Ocean Inlet Endowment was funded in December 1999. The first year of monitoring data indicates that maintaining an open tidal connection has had an extremely beneficial impact on the lagoon ecosystem. In particular, water quality fluctuated less and severe decreases in dissolved oxygen and salinity levels were not seen. Fish species diversity and abundance were also markedly increased over the past year. The first year report estimates that additional funds will be needed to keep the inlet open year-round. This is due to the need for more maintenance operation each year than originally projected, and a revised estimate of fund performance based on more conservative assumptions.

#### **Attachments**

1. Summary of costs and funding for projects completed or funded in fiscal year 2000-2001.
2. Status of Current Projects
3. Summary of Monitoring Results for 2000

**Southern California Wetlands Recovery Project  
Completed/Funded Projects -- Funding and Cost Summary**

<b>Projects (listed south to north)</b>	<b>Date Funded</b>	<b>Date Completed</b>	<b>Total Cost</b>	<b>SCC-WRP</b>	<b>Other State</b>	<b>Federal</b>	<b>Local</b>	<b>Private</b>
1. Tijuana Estuary (Friendship Marsh) Tidal Restoration Program - Phase II	4/01		\$658,000	\$450,000		\$208,000		
2. San Elijo Lagoon Exotics Removal	8/00	2/01	\$73,000	\$63,000				\$10,000
3. San Elijo Lagoon Preliminary Sediment Quality Assessment	8/00		\$133,882	\$67,000		\$66,882		
4. Buena Vista Lagoon Restoration Plan	2/01		\$623,000	\$200,000	\$60,000			\$373,000
5. Topanga Lagoon and Watershed Restoration Feasibility Study	9/00		\$483,800	\$110,000	\$253,800		\$120,000	
6. Matilija Dam Feasibility Study	10/00		\$2,335,000	\$750,000	\$1,000,000	\$550,000	\$35,000	
7. Arroyo Hondo Watershed Acquisition	10/00		\$6,176,000	\$1,000,000	\$3,000,000		\$350,000	\$1,826,000
8. Santa Barbara Urban Streams and Wetlands Restoration Project	10/00		\$280,000	\$280,000				
<b>TOTAL</b>			<b>\$10,762,682</b>	<b>\$2,920,000</b>	<b>\$4,313,800</b>	<b>\$824,882</b>	<b>\$505,000</b>	<b>\$2,209,000</b>

## Attachment 2 – Status of Current Projects

### San Diego County

1. **Goat Canyon Enhancement Project** – The draft environmental document for Goat Canyon project is expected to be completed in August 2001. Final engineering and design plans sediment control and creek restoration project are in preparation. Project construction is scheduled to begin in Fall 2002.
2. **Famosa Slough Culvert Extension and Retrofit** – In February 2001, the City of San Diego completed a study to evaluate the feasibility of increasing tidal flow into Famosa Slough by reactivating a plugged culvert. The study found that reactivating the culvert would be relatively simple and inexpensive. The WRP is working with City of San Diego to proceed with implementation. This project is the requisite precursor to several actions recommended in the Famosa Slough Enhancement Plan.
3. **Rose Creek Tidal Restoration Plan** – The Rose Creek Enhancement Plan was recently completed. The plan identifies several project to enhance the creek's biological and hydrological functioning. Some of these projects can only be implemented if structural changes to two bridges are undertaken. The next step for the WRP will be to prepare a CEQA document, and design and engineering plans for projects that are ready to commence.
4. **Cottonwood Creek Enhancement Project** – This project is being moved into the small grants program.

### Orange County

5. **San Joaquin Marsh Enhancement - Phase II** – The Coastal Conservancy is working with staff from the U.C. Natural Reserve System to develop the scope of work for Phase II planning. Phase II involves enhancement of approximately 120 acres of permanent and seasonal marshes. Coastal Conservancy approval of funding is expected by Fall 2001.
6. **Huntington Beach Acquisitions** – The Coastal Conservancy continues to pursue acquisition of three parcels at the Huntington Beach wetlands. An agreement has been reached for acquisition of the 20-acre Edison property and funding has been approved. A final purchase agreement still needs to be negotiated on this property. This acquisition should be complete by Summer 2001. The Conservancy is also negotiating with the Estate of Daisy Piccirelli for acquisition of the Piccirelli property. The estate has declared bankruptcy so any sale will have to be approved by the bankruptcy court. The Conservancy has opened discussions with the University of California regarding the third piece of property which was donated to U.C. Riverside in March 2000.
7. **Hellman Ranch Acquisition (Los Cerritos)** – An appraisal is being prepared for approximately 100 acres of the lowland area. The appraisal should be completed by the end of May 2001.

## Los Angeles County

8. **Bryant Ranch Acquisition (Los Cerritos)** – The Trust for Public Land is taking the lead on negotiations for the 85-acre Bryant Ranch property. An appraisal is being prepared and should be completed by the end of May 2001.
9. **Bixby Ranch Acquisition (Los Cerritos)** – The Conservancy's option agreement expired in December 2000, but landowners continue to show an interest in selling the property for wetland restoration. At the request of Conservancy staff, the Trust for Public Land is now leading negotiations with the landowner. An update of the 1998 appraisal is underway and should be completed by the middle of June 2001.
10. **El Dorado Wetlands Restoration Plan** – The Conservancy has had preliminary discussions with the City of Long Beach regarding preparation of a restoration plan for the El Dorado wetlands at the confluence of Coyote Creek and the San Gabriel River.
11. **Malibu Lagoon Water Level Control Project** – The Department of Parks and Recreation has selected a consultant to prepare a plan for this project which involves installing an inflatable weir to control water levels in the lagoon during the dry season.
12. **Upper Malibu Creek Feasibility Study (Rindge Dam)** – The Department of Parks and Recreation and the Army Corps of Engineers are negotiating a local sponsor agreement for the project. The Feasibility Study will look at options for removing barriers to fish passage, including the possible removal of Rindge Dam. Work on the Feasibility Study will commence once the local sponsor agreement has been signed by both parties.
13. **Solstice Creek Steelhead Enhancement** – Funding for final design plans and permits was approved by the Coastal Conservancy in March 2001. The project will address several steelhead passage barriers in the creek. Implementation of this project could begin by winter 2001.

## Ventura County

14. **Lower Conejo Creek Acquisition** – Negotiations continue with the project partners and the landowner. The Habitat Subcommittee of the Calleguas Creek Watershed Steering Committee has approved the acquisition as a priority. A conceptual restoration plan is being prepared. Acquisition is expected in Summer 2001.
15. **Ormond Beach Wetlands Restoration Plan** – The Conservancy is working with project partners to develop a scope of work for this Restoration Plan. Approval of funding for this project is expected by Fall 2001. The plan will take approximately 18 months to prepare.
16. **Ormond Beach Wetlands Acquisition** – In January 2001, Southern California Edison ceased negotiations with the Coastal Conservancy for acquisition of approximately 300 acres of the Ormond Beach wetlands property. Edison stated its intent to evaluate the site's potential use for expanded power generation facilities. Edison had previously sold to an agricultural interest 300 acres of agricultural land for which the Conservancy had also been negotiating. Completion of the Edison acquisition had been delayed by negotiations related

to long-term liability issues. The Conservancy has opened discussions with the City of Oxnard and MWD for acquisition of the MWD property.

17. **Coastal Berry Acquisition** – The Conservancy continues to negotiate details of the purchase agreement. The appraisal is being reviewed by the State Department of General Services. One unresolved issue is whether the property will be acquired directly by the Conservancy or through a grant to a local organization. Acquisition is expected by Summer 2001. In the updated Work Plan, this project will be subsumed into the “Santa Clara River Parkway Acquisition Program.”
18. **Ventura River Zellerbach Property Acquisition** – Conservancy staff will work to identify a local partner to assist with this project.

#### Santa Barbara County

19. **Summerland/Greenwell Preserve Restoration** – Conservancy staff are working with the Summerland Greenwell Preserve to finalize CEQA and permitting requirements. Funding for this project is expected to be approved by August 2001.
20. **Goleta Slough Tidal Restoration Study** – The planning phase of the tidal restoration study commenced in March 2001 and will take approximately one year to complete.
21. **Arroyo Hondo Watershed Acquisition** – The Land Trust for Santa Barbara County has an option to purchase the 800-acre ranch for \$6,176,000. The Coastal Conservancy authorized a \$4 million grant to the Land Trust in October 2000, including \$1 million of WRP funds. Additional funds are expected from WCB. The Land Trust must now raise the remaining funds by October of this year. Potential sources include County Park Bond funds, Caltrans EEMP grant, and foundation funding.

#### Withdrawn from Work Plan

1. **Fallbrook Utility District Acquisition** – The Fallbrook Utility District, owners of the subject property, have decided not to sell the property at this time. Therefore, the project is being withdrawn from the WRP Work Plan.
2. **Huntington Beach Wetlands Restoration Plan** – Acquisition of the Huntington Beach wetlands properties have been delayed for several reasons including transfer of property ownership and the declared bankruptcy of one property owner. These delays have in turn delayed the start of restoration planning. The WMG recommends withdrawing this project from the Work Plan until the property acquisitions have been resolved.
3. **Hearthside (Fieldstone) Property Acquisition** – The owners of the Fieldstone property are no longer willing to sell the property at this time. Therefore, the project is being withdrawn from the Work Plan.
4. **McGrath Lake Area Acquisitions** – Negotiations for acquisition of these parcels have been complicated by pollution issues in McGrath Lake. The McGrath Lake Trustee Council is

working to resolve these issues. This project is being withdrawn from the Work Plan until the pollution concerns have been addressed.

5. **Del Playa Vernal Pools Acquisition** – Negotiations for acquisition of the Del Playa vernal pools have stalled because the landowners would like more money than the Isla Vista Park and Recreation District estimate the property to be worth. Therefore, the project is being withdrawn from the Work Plan at this time.



## Summary of Monitoring Results for 2000

### A. Tijuana Estuary Model Marsh

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Construction of the 20-acre Model Marsh was completed in February 2000. The first year monitoring report for the Tijuana Estuary Model Marsh is in preparation. Elements of the monitoring program are summarized below, along with preliminary findings of the monitoring report. The monitoring report will be posted to the Wetlands Recovery Project webpage once it is complete.

Monitoring efforts at the Model Marsh are divided into six different projects. Some of these projects will evaluate specific research questions that were incorporated into the design of the Model Marsh. These research projects are being led by the Pacific Estuarine Research Lab (PERL). The five monitoring projects and preliminary first year findings are discussed below.

#### 1. Tidal Creeks Project

The Model Marsh was designed with 6 cells – three with tidal creeks and three without – to assess the effects of including tidal creeks in the restoration design. The Tidal Creeks project monitors various components of the restoration project to assess this question. Monitoring includes:

- Fish monitoring in the feeder channel.
- Invertebrate cores.
- Minnow trapping study to examine if tidal creeks facilitate fish movement into the tidal plain.
- Sedimentation rates.
- Soil parameters.
- Channel morphology.
- *Spartina* development is being monitored to evaluate the establishment of *S. foliosa* under different planting densities, and with and without kelp amendments.
- Marsh plain plant species. The objective is to evaluate the success of marsh plain species planted at different cluster distances, with and without kelp amendments, and at varying distances to tidal creeks or no tidal creeks.

First year monitoring found an initial increase in both fish and invertebrate densities. Eight species of fish have been found in the marsh. Initial data from the minnow trapping study found that fish were not more abundant in the cells with tidal creeks; however, they were more evenly distributed over both the low- and mid-marsh areas in these cells. Thus, in the cells without creeks, fish were “crowded” into the low marsh areas. If food resources become limited in these areas, growth and reproduction rates will also be negatively affected. Continued monitoring will assess whether this distribution trend persists. Soil analyses show that organic matter content is quite low and has not increased appreciably since the marsh opening. Monitoring for the *Spartina* and marsh plain studies has not begun yet.

## **2. Restoration of coastal wetlands invertebrates**

This project will do the following: 1) examine successional trajectories for invertebrates and algae during the first 2.5 years of development; 2) develop methods to experimentally seed invertebrate and algal taxa that are dominant in the nearby natural marsh, but are slow to recover in the created system; and 3) develop stable-isotope-based methods to assess recovery of trophic function in created wetlands. This involves evaluation of food web structure, including the primary producer base in the created Model Marsh relative to the adjacent natural salt marsh. Predictions about mechanisms and sequence of invertebrate succession in restored wetlands of Tijuana will be tested in these studies.

First year data tracked the colonization of the site invertebrates. Polychaetes dominated in the Model Marsh sediments, whereas insects are dominant in the natural marsh areas of Tijuana Estuary. Infaunal densities rose significantly over the first year period, approaching those found in the natural marsh areas.

## **3. Enhancing germination and establishment in salt marsh restoration**

This project seeks to characterize some of the factors that influence plant community development in a restored marsh including seed dispersion, seed germination, seed bank development, and inter-specific mechanisms (e.g., facilitation). Comparison data from a natural marsh will serve as a reference and provide a guideline for the desired outcome of restoration.

First year data is still being compiled for this study. Preliminary results of the seed bank analysis found no viable seeds.

## **4. Vegetation Monitoring**

The vegetation monitoring is being conducted in compliance with state and federal permits for the restoration project, and focuses on the development of transplanted cordgrass. Semi-annual surveys of cordgrass expansion will be conducted over the next 3-5 years to provide information for subsequent phases of the Tijuana Estuary Tidal Restoration Program. Key concerns are plant survivorship and percent vegetative cover.

The first year data shows that the planted cordgrass had an initial mortality rate of about 25%. Subsequent surveys found no further cordgrass mortality and expansion of the initial cordgrass planting. In addition, most of the cordgrass was either in flower or had produced seeds at the time of the second survey. A scale insect was observed feeding on some of the cordgrass. This insect is a known pest that can reach outbreak proportions and will be closely monitored.

## **5. Colonization and resource use by birds**

Bird use of the restored Model Marsh will be monitored on a periodic basis. Monitoring data records species, specific habitat location, and behavior. Use of the marsh by migratory and endangered species is key concern.

First year monitoring data of bird use showed that bird use and diversity in the Model Marsh increased over the course of the year. Foraging was the most common use of the marsh, with mudflat and cordgrass habitat being utilized the most. Species use of the marsh rose dramatically in the fall and winter of 2000 due to migratory birds. American avocets, killdeer, and black-nested stilts have nested around the marsh and have encouraged their offspring to forage in the mudflats. California least tern and Belding's savannah sparrow have been observed foraging in the marsh.

## **B. San Joaquin Freshwater Marsh**

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The enhancement project for the San Joaquin Freshwater Marsh Reserve (Reserve) at the University of California, Irvine (UCI) includes the excavation and revegetation of seasonal freshwater ponds as well as the creation of coastal sage scrub and riparian habitats on the uplands. Construction of the ponds was completed in April 2000 and the initial installation of bulrush species and riparian shrubs in and around the ponds was completed in June 2000. Preparation and planting of the coastal sage scrub and riparian habitats began in November 1999 and will continue for five years. Experimental plots within the coastal sage scrub planting program will advance the science of restoring this sensitive habitat. The following monitoring results cover the period from November 1999 to November 2000.

### **1. Coastal Sage Scrub**

Approximately 19 acres of coastal sage scrub habitat will be created in five zones over a five year period on UCI's upland buffer zone surrounding the San Joaquin Marsh Reserve and on the northwestern face of the San Diego Creek dike within the Reserve itself. The planting design is a mosaic pattern based upon vascular plant patchiness in a near neighbor natural model, developed and quantified from digitized photographs and transects (Bowler and Demerjian 1996). Ground truthing of these mosaics has been conducted at a local site of similar exposure so these aggregates are representative of indigenous stands. In addition to nursery grown container material, plants salvaged from wild stands on the campus will be translocated to the project area.

Phase 1 and 2 were the focus during this first year. During fall 1999, 1700 shrubs including California encelia (*Encelia californica*), black sage (*Salvia mellifera*), and coastal sagebrush (*Artemisia californica*) were installed in phase 1 from one gallon containers. Despite some plant mortality, one pair of California gnatcatchers successfully nested and fledged young in spring 2000. During fall 2000, 1000 shrubs were installed in phase 2 including the following species:

*Artemisia californica*  
*Isomeris arborea*  
*Encelia californica*  
*Eriogonum fasciculatum*  
*Heteromeles arbutifolia*  
*Lotus scoparius*

*Opuntia littoralis*  
*Salvia mellifera*  
*Mimulus aurantiacus*

Plant preparation and maintenance activities perfected during the project's first year include weed and herbivore control and irrigation. Since the coastal sage scrub areas are heavily colonized with non-natives such as black mustard (*Brassica nigra*), globe artichoke (*Cynara cardunculus*), poison hemlock (*Conium maculatum*), fennel (*Foeniculum vulgare*), and castor bean (*Ricinus communis*), weed abatement efforts prior to planting entail hand spraying Rodeo (glyphosphate) and hand clipping and removing dead stalks and seed heads. Weed abatement will be conducted throughout the coastal sage scrub zone for years to bring the non-natives under control and allow successful establishment of the sage scrub community. During the phase 1 planting, some shrubs were consumed by rodents; therefore, the planting protocol now entails spraying with a commercial non-toxic product (Ropel) which repels herbivores with its taste. Irrigation is conducted weekly or bi-weekly either with a water truck or by pumping water from the sediment pond.

## **2. Riparian Plantings**

During November 1999 a three quarter acre riparian woodland zone bordering one side of the seasonal ponds was planted with western sycamore (*Platanus racemosa*), black willow (*Salix gooddingii*), and shining willow (*Salix lucida ssp. Lasianдра*) from 60 fifteen gallon containers. Eventually shrubs such as California wild rose (*Rosa californica*) and mulefat (*Baccharis salicifolia*) will also be established. This mixture of trees and shrubs will provide a diversity of canopy and structure, allowing raptors and passerine birds perch habitat in an otherwise perch-poor habitat.

Despite irrigation, many of the plants lost their leaves due to heat and lack of rain; however, after spring 2000 rains, many plants produced buds. Rather than replace the plants that did not survive, staff have decided to manage the thousands of willow and mule fat shrubs which have colonized primarily the eastern sides of most ponds and the islands.

## **3. Wetland Monitoring**

A system of 11 freshwater seasonal ponds were created and planted with three species of bulrush (*Scirpus maritimus*, *Scirpus americanus*, and *Scirpus californicus*). The islands in the ponds were planted with riparian shrubs. The Reserve manager can control the diversity of seasonal and permanent wetlands with a newly installed water supply and distribution system. The freshwater habitat will be critical to the birds migrating along the Pacific flyway and will improve habitat for other resident species such as the California gnatcatcher, California least tern, and the Pacific pond turtle. The soil, vegetation, and water quality will be monitored over a ten year period. The results will be used to assess the success criteria defined in the project's Coastal Development Permit.

**a. Wetland Soil**

The wetland soil chemistry will be tracked as the ecology of the pond ecosystems evolve. To establish a baseline, samples were collected from each of the eleven ponds (including the sediment pond) and analyzed for a suite of metals (aluminum, arsenic, cadmium, chromium, lead, copper, mercury, selenium, and zinc) and organic components (nitrogen, phosphate). The analysis was conducted by the University of California's Division of Agriculture and Natural Resources in Davis, California. First year, soil analyses were unremarkable within the project area. Soil samples will be collected again in five years.

**b. Wetland Vegetation**

The density of the three bulrush species (*Scirpus maritimus*, *Scirpus americanus*, and *Scirpus californicus*) is monitored using a permanent hundred square foot quadrant for each of the three bulrush species in each pond. Stem counts in these quadrants were used to assess wetland vegetation spread during the first year (1999/2000) of the project. Results of monitoring in April and early August of 2000 indicated that while success occurred in some of the planting areas, particularly for *Scirpus californicus*, overall establishment was limited in about half of the project area. Because of high mortality during the installation contractor's maintenance period, it is likely that cover was less than the Coastal Development Permit's goal of 20-25% in many of the ponds.

As part of a broader re-establishment effort, the UCNRS is having a commercial seed collector collect enough seeds for the three species to provide ten viable seeds per square foot in the revegetation areas.

**c. Wetland Water Quality**

Water samples are taken from the shallow pond margins, from the surface in the deep area, and from the bottom of the deepest site within each pond. Samples from all ponds are taken on the same day with a representative series collected in the early morning and after sunset to capture data before and after diurnal photosynthesis. In addition to the dissolved oxygen, salinity, pH, and conductivity measurements taken at the time of collection using YSI equipment, water samples are analyzed by a State Certified water laboratory for ammonia, nitrite, nitrate, phosphate, turbidity, salinity, pH and other parameters.

The water quality data taken during the first year is useful as baseline information against which subsequent results can be compared. Most of the results were more or less uniform and were expected, but it will be interesting to see if changes in ammonia, for example, are repeated during the second year of sampling or if the changes seen in the first year were the of filling the newly constructed seasonal ponds for the first time. Overall, the water quality in the ponds reflects the source, San Diego Creek.

#### 4. Wildlife Observations

A pair of California gnatcatchers successfully nested and fledged young during spring 2000 in the phase 1 coastal sage scrub planting area. Extensive bird counts will be conducted for the November 2000 to November 2001 monitoring year.

### C. San Elijo Lagoon Ocean Inlet Endowment

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#### Health of the San Elijo Lagoon – 2000; prepared by the San Elijo Lagoon Conservancy

##### *Inlet Function*

The inlet of the San Elijo Lagoon has remained open for the last year with the exception of a five day period in December, when the inlet closed due to relatively flat tides and strong surf. It opened naturally the following week on a 7.4' spring tide.

The San Elijo Lagoon Conservancy conducted three mechanical dredging operations. The first opening in February, 2000 was conducted to lower the water level for nesting California Least Terns and Western Snowy Plovers. The project area extended from under the Hwy. 101 bridge west to the ocean. The second maintenance project was conducted in April 2000 and was the largest of the year. It included the channel east of the Hwy. 101 bridge, all bays under the bridge, and west of the bridge. Bacterial testing was conducted and levels inside the lagoon were below the standards and deemed safe for body contact. The last maintenance project was conducted in October. The project focused on clearing two bays under the bridge.

The inlet maintenance program is showing great success. The health of the lagoon has responded favorably to the open inlet throughout the entire year. Water Quality, invertebrates, fish and bird populations all benefit from a healthy marine environment.

##### *D.O., and Salinity*

The dissolved oxygen in the lagoon remained above 4 mg/l the entire year, a first in our ten year history of monitoring. In the past, the inlet closed during the summer months causing massive algal growth, leading to the deterioration of the dissolved oxygen. Major fluctuations in temperature exacerbated the situation. This past year we have seen these wide fluctuations in temperature, salinity, and dissolved oxygen diminish and begin to mimic the ocean instead. Salinity levels at five sampling stations, from the inlet to the I-5 bridge reached and maintained levels above 25ppt throughout the year.

##### *Invertebrates*

A few changes in invertebrate populations were noted. Razor clam, *Tagelus californianus* are increasing in numbers throughout the channel and the horn snail, *Cerithidea californica*, are slowly increasing in numbers. Some direct indicators on the inlet success are *Aplysia dactylomela* Spotted Sea Hare, *Navanax intermis*, *Neotrypaea* sp. Ghost Shrimp, *Palaemon macrodactylus* Shrimp, *Hemigrapsus oregonensis* Crab, *Uca* sp. Fiddler Crab, and *Hippolyte californica* Broken Back Shrimp. All were seen throughout the western and/or Central basins. The ghost shrimp were in large abundance in the eastern channel of the inlet. It is expected that

keeping the inlet open will continue further recruitment of additional invertebrate species primarily bivalves and crustaceans. It is expected that keeping the inlet open will continue further recruitment of additional invert species primarily bivalves and crustaceans. The entire lagoon was surveyed in October for larval stages and Polychaetes. Data is still pending. 40 cores were taken throughout the three basins.

### *Fish*

A total of 17 species were found during the surveys. Surveys were conducted by use of seine and blocking nets. Visual identification of the Butterfly Rays and Opaleye were made in the field. None were caught in the nets. This represents the most species ever found in the reserve and is directly related to the inlet maintenance operations. For the first time we are recruiting marine species that have the possibility of reproducing and surviving. Fish diversity was up considerably as was individual numbers. Several species not previously recorded in SEL by any literature or data search were:

<i>Gymnura marmorata</i>	California Butterfly Ray
<i>Myliobatis californica</i>	Bat Ray
<i>Paralabrax maculatofasciatus</i>	Spotted Sand Bass
<i>Girella nigricans</i>	Opaleye

Other species found include:

<i>Fundulus parvipinnis</i>	California Killifish
<i>Clevelandia ios</i>	Arrow Goby
<i>Quiatula ycauda</i>	Shadow Goby
<i>Acanthogobius flavimanus</i>	Yellowfin Goby
<i>Gillichthys mirabilis</i>	Longjaw Mudsucker
<i>Paralichthys californicus</i>	California Halibut
<i>Hypsopsetta guttulata</i>	Diamond Turbot
<i>Atherinops affinis</i>	Topsmelt
<i>Engraulis mordax</i>	Northern Anchovy
<i>Anchoa Compressa</i>	Deepbody Anchovy
<i>Mugil cephalus</i>	Stripped Mullet
<i>Syngnathus auliscus</i>	Barred Pipefish
<i>Leptocottus armatus</i>	Staghorn Sculpin

### *Birds*

On the bird front, we had a spectacular turnout for the annual Christmas bird count this year. With 17 participants counting away on December 22, they found 109 species and 5229 individuals. As was anticipated, numbers of many water birds were up due to the available tidal flats with the lagoon being open to the ocean. There was a 14 percent increase in species diversity, but a slight decrease in abundance from that of last year. Most of the decrease was attributable to lower numbers of some waterfowl species, likely influenced by increased acreage in tidal mudflats, that is, less open water, and the mild and dry winter. Mild temperatures may have caused several species to winter farther north than usual. Geese numbers throughout the count area were the lowest ever recorded due to the lack of rain and subsequent drying out of many feeding areas, including the pastures of the San Dieguito River Valley and the east end of Lake Hodges. For an

actual list of the bird count, please call or email and we will gladly send you one.

It is expected that keeping the inlet open will continue further recruitment of additional invert species primarily bivalves and crustaceans. The entire lagoon was surveyed in October for larval stages and Polychaetes. Data is still pending. 40 cores were taken throughout the three basins.

### *Summary*

The inlet maintenance program is showing great success throughout the lagoon. For the first time we are recruiting marine species that have the possibility of reproducing and continued survival. The lagoon's water quality has stabilized from the large variations when the inlet would close for long periods. With predictions of drought and the inlet taking in more sand, it is strongly recommend that the endowment principal be raised by \$700,000. This will ensure an additional two maintenance events during the year.

### *Recommendations for the future*

Following the first year of operation, the Lagoon Conservancy re-evaluated the assumptions upon which the size of the endowment fund was calculated and determined that the endowment needs to be augmented to ensure that a open tidal connection is maintained year-round. There are three main reasons for this. First, an unanticipated effect of maintaining an open ocean inlet was that more sand was swept into the lagoon in the past year than in previous years when the inlet remained closed for long periods of time. Thus, sand must be removed from the inlet more often. Second, a 30-year drought is projected for the region which would result in less scouring of the lagoon inlet by storm flows. Lastly, the Lagoon Conservancy has revised its projections of available funds based on a more conservative annual return rate from the endowment. A recommendation to augment the San Elijo Lagoon inlet management endowment is included on the proposed 2001-2002 Work Plan.